

## **Abstract Title Page**

**Title:** Do You See What I See? The Impact of School Accountability on Parent, Teacher, and Student Perceptions of the School Environment

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## **Abstract Body**

### **Background / Context:**

School accountability systems are a popular approach to improving education outcomes in the United States. These systems intend to “hold schools accountable” by assessing school performance on specific metrics, publishing accountability reports, and some combination of rewarding and sanctioning schools based on performance. Additionally, most states and many districts rank or categorize schools in some capacity. New York City (NYC), in particular, was an early adopter of a letter-grade (A-F) ranking system. School letter grades are intended to provide “new” information about school quality and to affect how community members view their schools. Ultimately, however, whether accountability letter grades influence stakeholders’ perceptions of schools is an empirical question.

The relationship between accountability and stakeholders’ perceptions of their schools is important to understand, because accountability systems are meant to provide new information to help parents and students choose better schools. On the one hand, if accountability changes parent and/or student perceptions of their schools, policymakers can be more confident that accountability does in fact provide useful information to these stakeholders. On the other hand, evidence that accountability systems do not affect stakeholders’ perceptions would suggest it is unlikely that accountability “works” by helping families make better decisions about schools.

A large body of research documents the effects of school accountability systems, though few studies consider the effects on stakeholder perceptions and no previous research explores effects on perceptual congruence within schools. NYC’s letter grade system has been the focus of two studies that use a regression-discontinuity approach and find that student achievement increases after schools receive “F” letter grades (Rockoff & Turner, 2010; Winters & Cowen, 2012). Additionally, Rockoff and Turner examine student, teacher, and parent survey responses in NYC and find that after a school receives an F grade, parent evaluations of schools improve, while student satisfaction drops; teacher satisfaction is not significantly affected. No studies, however, have estimated the effect of school accountability as a system (as opposed to receipt of an “F” grade) on stakeholder perceptions or on agreement in stakeholder perceptions within schools.

This study builds on prior work about “multi-source feedback,” which explores the relative perceptions of different individuals, often in the same company. This approach is applied to schools in studies of principal effectiveness (e.g., Goldring et al., 2009; Urick, 2012). Few studies, however, explore perceptual congruence about the school environment (e.g., Griffith, 1999, 2000; Urick & Bowers, 2014). This study focuses on between-group congruence (e.g., the difference in average parent and teacher perceptions within schools) and within-group congruence (e.g., variation in student perceptions within schools).

### **Purpose / Objective / Research Question / Focus of Study:**

This paper explores the extent to which NYC’s letter-grade accountability system affects parent, teacher, and student perceptions of their schools; in particular, it focuses on agreement about academic expectations and discipline, as much research documents the relationship between these school factors and student outcomes (e.g., Abdulkadiroglu et al., 2011; Angrist et al., 2010;

2011, 2013; Dobbie & Fryer, 2011, 2013a, 2013b; Fryer, 2014; Goddard, Sweetland, & Hoy, 2000; Phillips, 1997; Shouse, 1996).

The analysis addresses two key research questions: First, does NYC's accountability system affect parent, teacher, or student perceptions of their schools? Does it improve or worsen perceptions, and how does this vary by stakeholder group and school context? Second, does NYC's accountability system affect congruence in stakeholder perceptions, both within and between groups? That is, does accountability contribute to a shared understanding of the school environment among parents, teachers, and students?

**Setting:**

This study uses New York City data for the 2006-07 (2007) to 2011-12 (2012) academic years.

**Population / Participants / Subjects:**

The school-level analytic sample includes all middle schools with at least ten percent of parents, teachers, and students responding to the Learning Environment Survey (LES). The analytic sample includes approximately 95% of all NYC middle schools (please insert Figure 1 here). Middle schools are an especially desirable level of schooling for this study, as parents, teachers, and students in middle schools all respond to the LES, allowing me to compare parent, teacher, and student perceptions.<sup>1</sup> Additionally, there are relatively high survey response rates in middle schools. In 2012, for example, 89.6% of students, 82.8% of teachers, and 54.6% of parents in middle schools responded to the LES, compared to 76.4%, 85.0%, and 35.0% (respectively) for high schools (please insert Table 1 here). The final school-level sample includes 2,127 total school-year observations from 2007-2012. The individual-level panel includes all parents, teachers, and students in middle schools, for a total of 1,535,084 individual-year observations from 2007-2012.<sup>2</sup>

**Intervention / Program / Practice:**

New York City introduced progress reports for schools in the 2006-07 school year; specific schools were graded for the first time in different academic years, as new schools and those without relevant data (e.g., elementary schools without student test scores, high schools without graduation rates) are not graded (please insert Table 2 here). This means accountability was rolled out across schools within NYC over time. The NYC progress reports present considerable information about schools from a variety of sources. The most salient feature of the reports is a letter grade (A-F), which represents the NYCDOE's overall assessment of the school's performance. Overall grades are largely based on students' academic growth (60 points), students' academic performance (25 points), and the school environment (15 points), though the system is complicated and there are changes over time. Integral to the school progress reports is the annual LES, given to all teachers, all parents, and students in grades six through twelve beginning in the spring of 2007. Importantly, there are several domains (including academic expectations and discipline) for which parents, teachers, and students answer nearly identical questions (please insert Table 3 here).

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<sup>1</sup> Only students in grades 6-12 respond to the LES.

<sup>2</sup> In 2012, for example, there are 187,392 students, 105,920 parents, and 12,783 teacher respondents in the dataset.

### Research Design:

I use a difference-in-differences approach to estimate the effect of accountability on stakeholder perceptions and perceptual congruence. First, I estimate the impact of accountability on within-group congruence using a school-level model, as follows:

$$(1) \text{CONGRUENCE}_{st} = \beta_0 + \beta_1 \text{ACCT}_{st} + \mathbf{S}_{st}'\beta_2 + \mathbf{X}_{st}'\beta_3 + \mathbf{T}_{st}'\beta_4 + \alpha_s + t + \varepsilon_{st}$$

where CONGRUENCE reflects within-group congruence for parents, teachers, or students, and ACCT is an indicator variable that takes a value of one if school  $s$  was held accountable in year  $t$  and zero otherwise. A school is held accountable in year  $t$  if it receives a letter grade in the fall of year  $t$  (reflecting performance in year  $t-1$ ). Measuring accountability in this way reflects the rollout of letter-grade accountability over time, and  $\beta_1$  will reflect the effect of being held accountable (being assigned a letter grade), not the effect of receiving a specific letter grade. The model also includes vectors of time-varying school characteristics (e.g., size, attendance rate, suspension rate), student characteristics (e.g., race, poverty, educational needs), and teacher characteristics (e.g., experience, education) – all measured at the school level. Finally, the model includes school effects ( $\alpha_s$ ) and a linear time trend ( $t$ ).

In order to explore between-group congruence, I use a pooled individual-level model, as follows:

$$(4) \text{PERCEPTION}_{ist} = \beta_0 + \beta_1 P_i + \beta_2 St_i + \beta_3 \text{ACCT}_{st} * T + \beta_4 \text{ACCT}_{st} * P_i + \beta_5 \text{ACCT}_{st} * St_i + \mathbf{S}_{st}'\beta_6 + \mathbf{X}_{st}'\beta_7 + \mathbf{T}_{st}'\beta_8 + \alpha_s + t + \varepsilon_{ist}$$

In this model, PERCEPTION is a dichotomous variable taking a value of one if individual  $i$  (either a parent, teacher, or student) has a favorable survey response.  $P$  and  $St$  are indicator variables reflecting whether individual  $i$  is a parent or student (with teachers the reference group); thus,  $\beta_1$  and  $\beta_2$  reflect pre-accountability differences in parent-teacher and student-teacher perceptions, and these coefficients can be compared to calculate parent-student congruence. The interactions between accountability and respondent type indicators estimate the effect of accountability on parent, teacher, and student perceptions. For example, the coefficient on  $\text{ACCT} * T$  reflects the impact of accountability on a teacher's likelihood of giving a favorable survey response. Finally, by adding the coefficients from the individual indicators and the individual-times-accountability interactions, I can calculate the post-accountability differences in stakeholder perceptions within schools. For example, the post-accountability parent-teacher "gap" will be captured by  $(P + \text{ACCT} * P) - (\text{ACCT} * T)$ . The difference in pre- and post-accountability gaps will reflect the impact of accountability on between-group congruence, and I use F-tests to determine if these differences are significant. Thus, results from this specification will provide information both about how accountability affects individual perceptions and about how accountability affects between-group congruence.

### Data Collection and Analysis:

I merge data from the NYC progress reports, the LES, and the New York State Report Cards (SRCs) to create a longitudinal dataset of NYC schools and students from 2007-2012. Progress reports provide letter grades and response rates, the LES provides survey responses, and SRCs provide data on school characteristics, such as size/enrollment, teacher turnover, student attendance, suspension rates, average student characteristics, and average teacher characteristics

Questions on the LES have Likert scale-type responses, for example with individuals answering that they strongly agree, agree, disagree, or strongly disagree with a given statement. I first re-code all individual responses so higher values reflect more favorable views, and then I create separate dichotomous measures that reflect favorable perceptions (a score of 3 or 4 out of four on the 1-4 measures). Average stakeholder perceptions (1-4) are relatively high, and parents tend to have more favorable views than other stakeholders (please insert Figure 2 here).

To assess perceptual congruence within schools, I use two different types of measures: within-group congruence and between-group congruence. Within-group congruence is measured using the coefficient of variation (standard deviation divided by the mean) for each stakeholder group within a school. Thus, the coefficient of variation will always be positive; higher values reflect greater variation in stakeholder perceptions, relative to the mean, and indicate less congruence. Though there is variation across domains, students tend to demonstrate higher within-group congruence than parents or teachers (please insert figure 3 here).

For descriptive analyses, I measure between-group congruence as the difference in average stakeholder views within schools (please insert figure 4 here), but there are considerable difficulties with modeling between-group congruence using school-level measures (Cronbach & Gleser, 1953; Edwards, 1994, 1995, 2001; Edwards & Parry, 1993; Johns, 1981). I avoid these issue by using an individual-level model to estimate the effect of accountability on between-group congruence, as previously described.

### **Findings / Results:**

Results indicate that in NYC, accountability increases within-group congruence for parents and teachers but decreases congruence for students (please insert Table 4 here). Furthermore, accountability positively affects stakeholder perceptions of expectations and discipline, with the exception that accountability contributes to lower student perceptions of expectations (please insert Table 5 here). Differences in the effect of accountability on parent, teacher, and student perceptions result in changes in between-group congruence, in most cases decreasing congruence by widening existing gaps between stakeholder groups. For example, parents tend to have more favorable views of expectations than students in the same schools, and accountability increases parent perceptions but worsens student perceptions.

### **Conclusions:**

This study will make important contributions to the literature on school accountability by providing the first rigorous estimates of how a school accountability system affects parent, teacher, and student perceptions of schools, and in particular how accountability affects the congruence of stakeholder perceptions within schools. Publicizing new, salient information about school quality is a key function of school accountability systems, and this study will provide evidence about whether and to what extent school accountability in NYC affects stakeholder perceptions. This study will also advance the research on perceptual congruence in schools. Most studies of stakeholder congruence in schools use small samples and cross-sectional data to explore within- or between-group congruence. This study uses a large-scale survey of parent, teacher, and student perceptions to explore congruence within and between three different stakeholder groups over time. Further, the large sample size and six-year panel allow for more rigorous methods and a more comprehensive analysis of congruence across multiple domains.

## Appendices

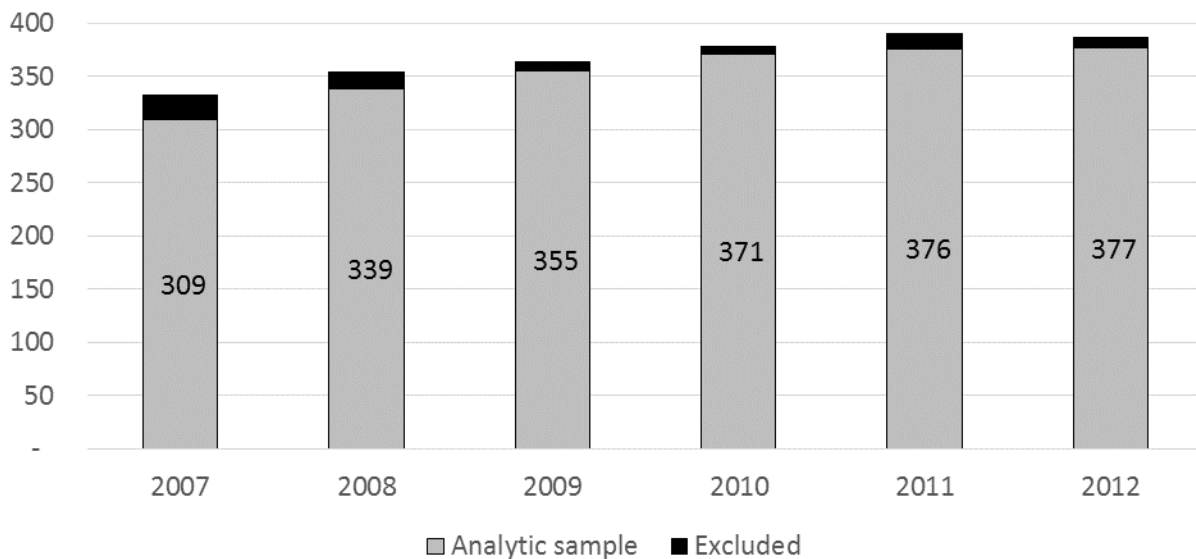
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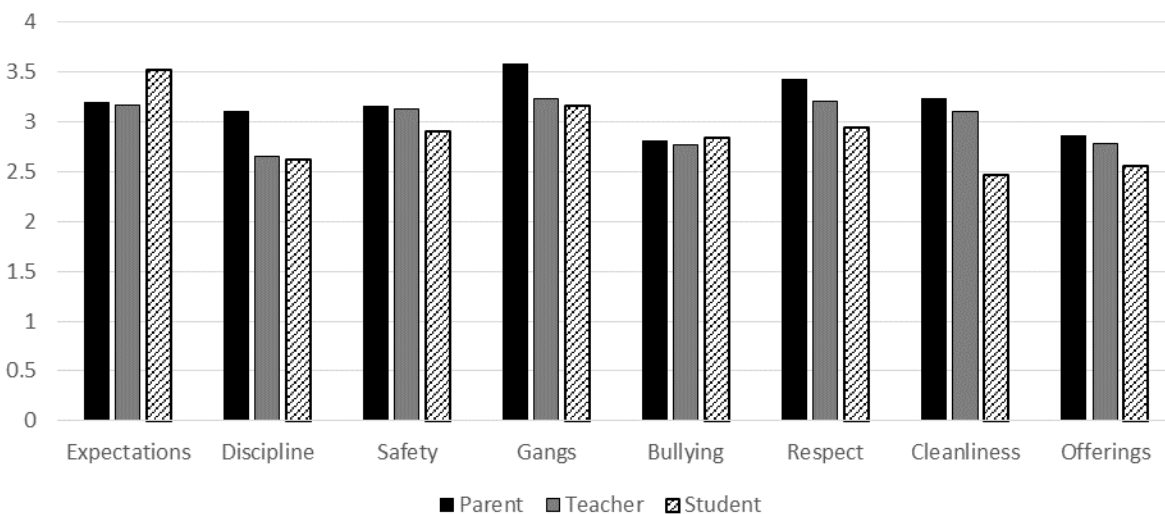
## Appendix B. Tables and Figures

Figure 1: Analytic sample includes all middle schools with at least 10% of parents, teachers, and students responding; 2007-2012



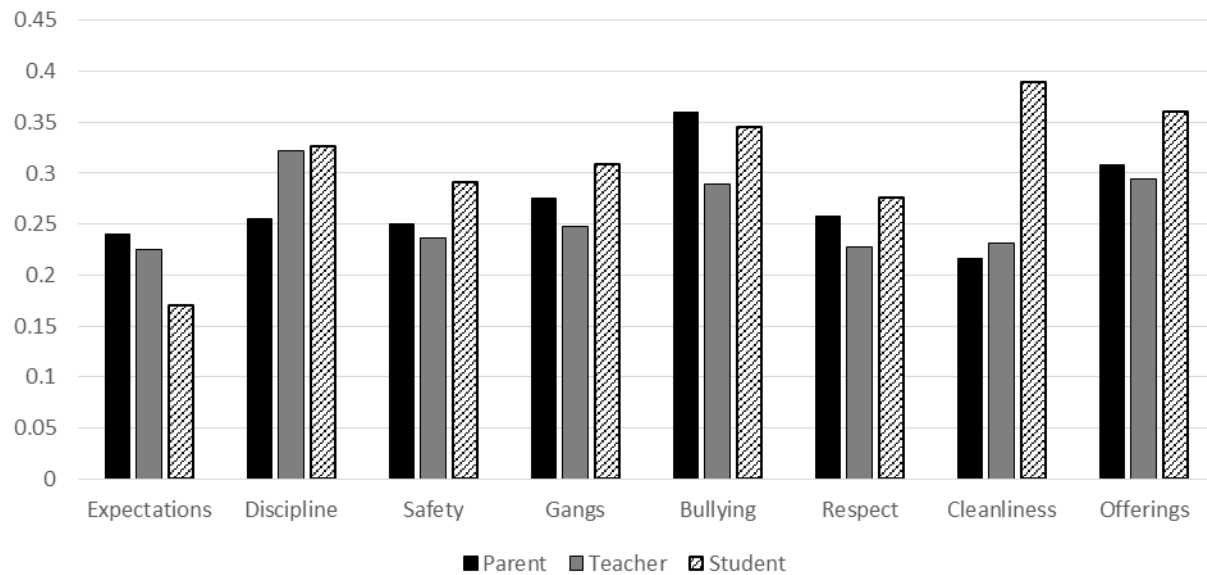
Note: Percent of middle schools in analytic sample: 2007 (93%), 2008 (96%), 2009 (98%), 2010 (96%), 2011 (96%), 2012 (97%)

Figure 2: Average stakeholder perceptions, 1-4, with 4 reflecting more favorable views, middle schools, 2007



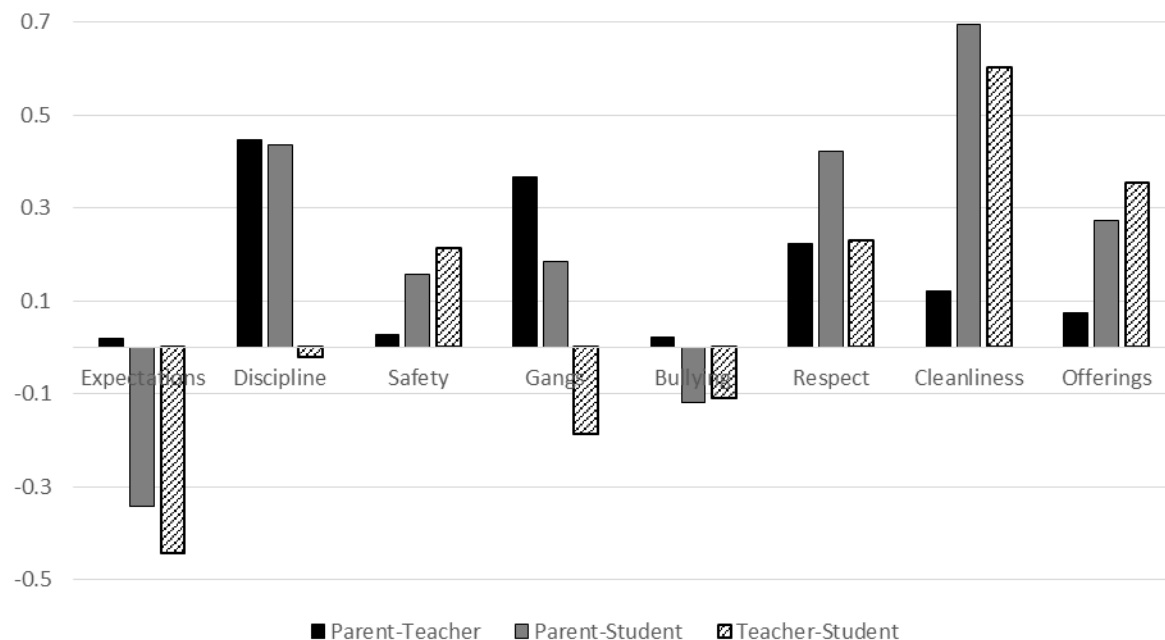
Note: Bars show the average perceptions of parents, teachers, and students in middle schools across all schools (1-4).

Figure 3: Within-group congruence – average coefficient of variation in stakeholder views within schools, middle school analytic sample, 2007



Note: The coefficient of variation is the standard deviation by the mean; thus, a value of “0” indicates complete congruence and higher values reflect less congruence.

Figure4: Average between-group congruence (difference in average stakeholder views within schools), middle schools, 2007



Note: Bars show the average difference in average stakeholder perceptions within schools, using the 4-point scale. For example, a school’s parent-teacher difference for expectations is the school’s average parent perception of expectations (1-4) minus the school’s average teacher perception of expectations (1-4). Therefore these differences could range from -3 to +3. This figure shows the average of between-group differences across all schools.

Table 1: Parent, teacher, and student response rates to the NYC Learning Environment Survey, by school type, 2007-2012

		<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Elementary (%)	Parent	35.5	57.5	62.8	66.1	68.4	69.4
	Teacher	49.2	67.4	77.3	78.3	83.4	83.1
	Student*	81.7	87.9	93.8	95.7	94.5	94.6
Middle (%)	Parent	21.7	36.4	43.3	50.1	52.9	54.6
	Teacher	42.7	61.2	74.3	77.5	82.2	82.8
	Student	69.8	84.8	86.0	88.7	89.0	89.6
K-8 (%)	Parent	30.1	46.3	53.0	56.8	60.7	60.6
	Teacher	44.0	58.1	72.3	75.6	81.4	82.6
	Student*	75.8	88.5	90.9	92.1	93.2	93.6
High (%)	Parent	17.0	23.6	27.0	33.3	36.4	35.0
	Teacher	43.3	60.1	75.2	80.7	83.9	85.0
	Student	60.9	71.1	75.6	77.2	77.7	76.4

\*Note: Only students in grades 6-12 respond to the survey. The response rate for elementary school students includes only the 6<sup>th</sup>-graders in elementary schools. Similarly, response rates for K-8 schools only includes 6<sup>th</sup>-8<sup>th</sup> graders.

Table 2: Number and percent of schools held accountable over time, by school type

	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>Elementary</b>	0	570	586	587	590	594
	0%	90%	89%	87%	85%	85%
<b>Middle</b>	0	290	323	334	352	367
	0%	82%	89%	88%	90%	95%
<b>K8</b>	0	128	140	150	155	161
	0%	90%	99%	99%	100%	100%
<b>High</b>	0	197	237	248	271	280
	0%	61%	68%	68%	72%	72%

Note: schools are considered “accountable” if they have ever received a school letter grade. This table includes all schools, not just those in the analytic sample.

Table 3: NYC Learning Environment Survey sample domains and questions, 2007-2012

<b>Domain</b>	<b>Teacher</b>	<b>Parent</b>	<b>Student</b>
Expectations	<ul style="list-style-type: none"> <li>My school sets high standards for student learning.</li> <li>My school sets high standards for student work in their classes.</li> </ul>	The school has high expectations for my child.	<ul style="list-style-type: none"> <li>I need to work hard to get good grades at my school.</li> <li>My teachers expect me to continue my education after high school.</li> </ul>
Discipline	Order and discipline are maintained at my school.	Discipline is enforced fairly at my child's school.	Discipline in my school is fair.
School safety	I am safe at my school.	My child is safe at school.	<ul style="list-style-type: none"> <li>I am safe in my classes.</li> <li>I am safe in the hallways, bathrooms, and locker rooms.</li> <li>I am safe on school property outside my school building.</li> </ul>
Gang activity	Gang activity is a problem in my school.	There is gang activity in my child's school.	There is gang activity in my school.
Bullying	Students in my school are often threatened or bullied.	Students threaten or bully other students.	Students threaten or bully other students at school.
Teachers' respect for students	Adults at my school are often disrespectful to students.	School staff are disrespectful to students.	Teachers in my school treat students with respect.
Cleanliness	The school is kept clean.	My child's school is clean	My school is kept clean.
Course / activity offerings	My school offers a wide enough variety of activities or courses to keep students engaged at my school.	My child's school offers a wide enough variety of courses and activities to keep my child interested in school	My school offers a wide enough variety of classes and activities to keep me interested in school.

Table 4: Effect of accountability on within-group congruence (coefficient of variation), middle schools, 2007-2012

Outcome: CV	Expectations			Discipline		
	Parent (1)	Teacher (2)	Student (3)	Parent (4)	Teacher (5)	Student (6)
Accountable	-0.025*** (0.002)	-0.010** (0.004)	0.028*** (0.002)	-0.017*** (0.003)	-0.028*** (0.007)	0.010*** (0.003)
Attendance rate	-0.012** (0.006)	0.017 (0.011)	0.012** (0.005)	0.003 (0.007)	-0.011 (0.017)	0.014* (0.008)
Suspension rate	0.030** (0.014)	-0.005 (0.024)	0.006 (0.011)	0.069*** (0.016)	-0.001 (0.039)	0.010 (0.017)
Turnover rate	0.020** (0.008)	0.015 (0.014)	0.008 (0.006)	0.008 (0.009)	0.007 (0.022)	0.004 (0.010)
Enrollment (log)	0.056*** (0.004)	0.038*** (0.007)	-0.003 (0.003)	0.047*** (0.005)	0.066*** (0.011)	0.005 (0.005)
Poor (share)	-0.008 (0.005)	-0.016* (0.009)	-0.011*** (0.004)	-0.006 (0.006)	-0.009 (0.015)	-0.017** (0.006)
LEP (share)	-0.028 (0.034)	-0.004 (0.058)	0.018 (0.028)	-0.037 (0.039)	0.029 (0.095)	0.005 (0.042)
Black (share)	0.045 (0.044)	-0.038 (0.076)	0.018 (0.036)	0.088* (0.052)	0.236* (0.125)	0.089 (0.055)
Hispanic (share)	-0.015 (0.043)	-0.047 (0.075)	-0.003 (0.036)	-0.013 (0.051)	0.133 (0.123)	-0.001 (0.054)
Asian (share)	0.061 (0.045)	-0.009 (0.078)	-0.020 (0.037)	0.123** (0.053)	0.017 (0.128)	-0.042 (0.056)
Racial concentration	-0.054** (0.027)	-0.038 (0.047)	-0.023 (0.022)	-0.023 (0.032)	0.023 (0.077)	-0.045 (0.034)
Fewer 3 yrs exp (share)	0.000 (0.008)	0.012 (0.014)	0.038*** (0.007)	0.036*** (0.010)	0.005 (0.023)	0.051*** (0.010)
Master's + (share)	0.001 (0.012)	0.025 (0.020)	0.007 (0.010)	0.002 (0.014)	-0.059* (0.033)	-0.010 (0.014)
Not highly qual. (share)	0.028*** (0.008)	-0.020 (0.014)	0.000 (0.007)	0.022** (0.009)	-0.026 (0.023)	-0.015 (0.010)
Year trend	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y
Observations	2,021	2,021	2,021	2,021	2,021	2,021
R-squared	0.706	0.630	0.608	0.641	0.666	0.668

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: All rates and shares are measured from 0-1. Higher values of the coefficient of variation indicate less congruence; this means that negative coefficients indicate a variable is positively associated with congruence. Racial concentration is measured using a Herfindahl-Hirschman Index (HHI). Higher values of the HHI reflect greater racial concentration. If black, Hispanic, Asian, and white students were equally represented, the HHI would equal 0.025; if only one student race group were represented in a school, the HHI would equal one.

Table 5: Regression results, effect of accountability on favorable individual perceptions of expectations and discipline (linear probability model); middle schools, 2007-2012

Expectations						Discipline				
VARIABLES	(1)	(2)	(3)			(4)	(5)	(6)		
Parent	0.004*** (0.001)	-0.051*** (0.017)	-0.069*** (0.017)			0.184*** (0.002)	-0.323*** (0.034)	-0.310*** (0.035)		
Student	0.041*** (0.001)	-0.131*** (0.016)	-0.103*** (0.016)			-0.042*** (0.002)	-0.342*** (0.033)	-0.332*** (0.034)		
Account*T			0.030*** (0.006)					0.047*** (0.012)		
Account*P			0.059*** (0.001)					0.019*** (0.002)		
Account*S			-0.020*** (0.001)					0.028*** (0.002)		
Schl controls	N	Y	Y			N	Y	Y		
Year trend	Y	Y	Y			Y	Y	Y		
School FE	N	Y	Y			N	Y	Y		
<u>Between-group differences</u>			<i>Pre-Acct</i>	<i>Post-Acct</i>	<i>Difference</i>			<i>Pre-Acct</i>	<i>Post-Acct</i>	<i>Difference</i>
P-T Diff	0.004***	-0.051***	-0.069***	-0.040***	<u>0.029***</u>	0.184***	-0.323***	-0.310***	-0.338***	-0.028**
S-T Diff	0.041***	-0.131***	-0.103***	-0.153***	-0.050***	-0.042***	-0.342***	-0.332***	-0.351***	-0.019
P-S Diff	-0.037***	0.079***	0.034***	0.113***	0.079***	0.226***	0.019	0.022	0.013	<u>0.008***</u>
Observations	1,479,690	1,471,745	1,471,745			1,416,936	1,409,316	1,409,316		
R-squared	0.010	0.020	0.023			0.063	0.096	0.097		

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Constant not shown.

Note: Models include fully interacted control variables: attendance rate, suspension rate, % poor, LEP, black, Hispanic, Asian, racial concentration, fewer than 3 yrs exp, Masters degrees, not highly qualified, turnover rate, and log of enrollment are all interacted with P and S (T is reference group, also included in model – not interacted). When the difference in pre- and post- accountability between-group gaps represents an increase in perceptual congruence (a narrowing of the gap), the value **is bolded and underlined**. The “accountable” variable takes a value of one if the school has ever received a school letter grade.